



**National
Transportation
Safety Board**

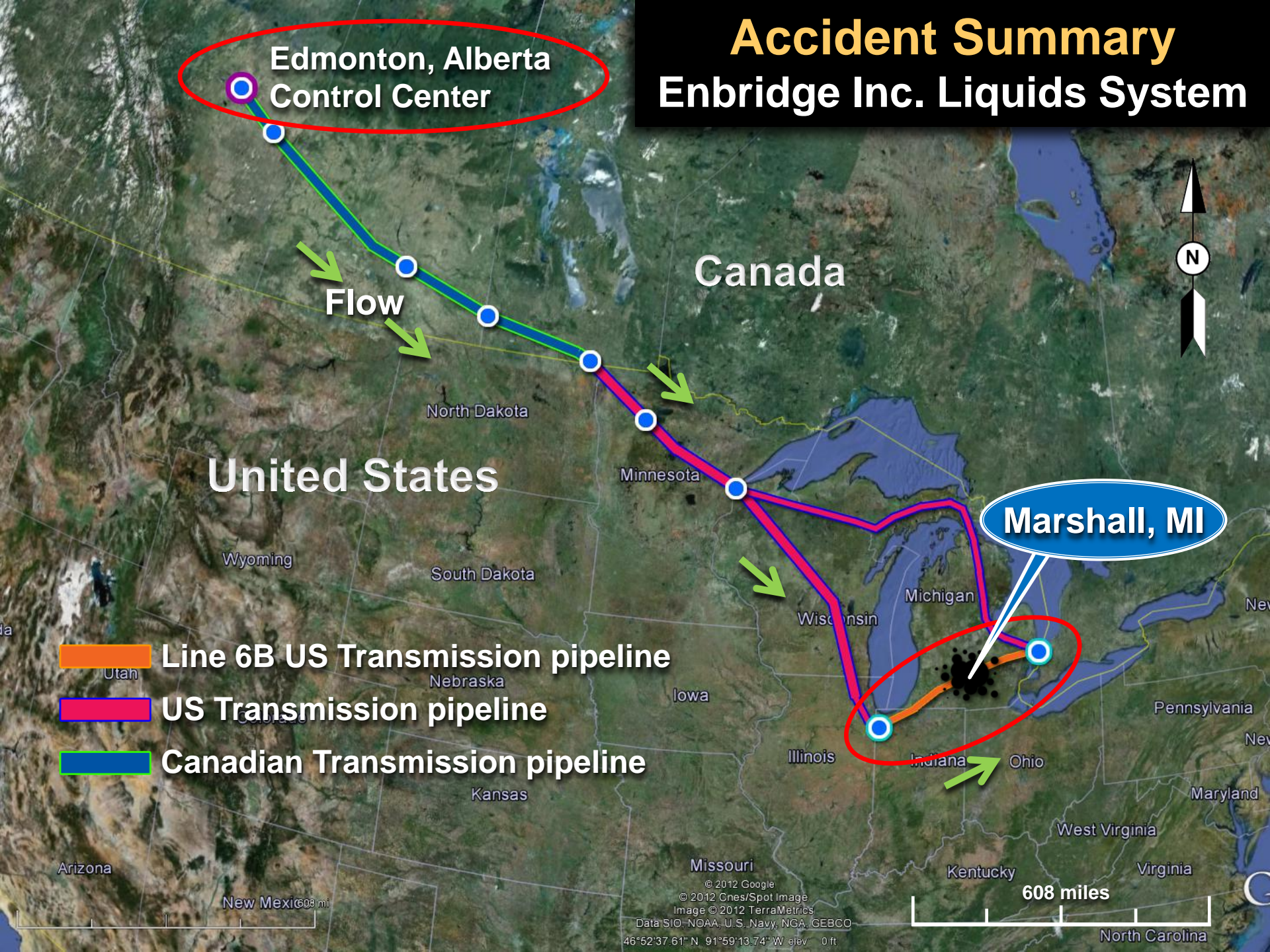
NTSB Safety Culture Forum

Enbridge Line 6B Pipeline Rupture with Crude Oil Release Marshall, Michigan, July 2010

Matt Nicholson, PE: Pipeline Investigator

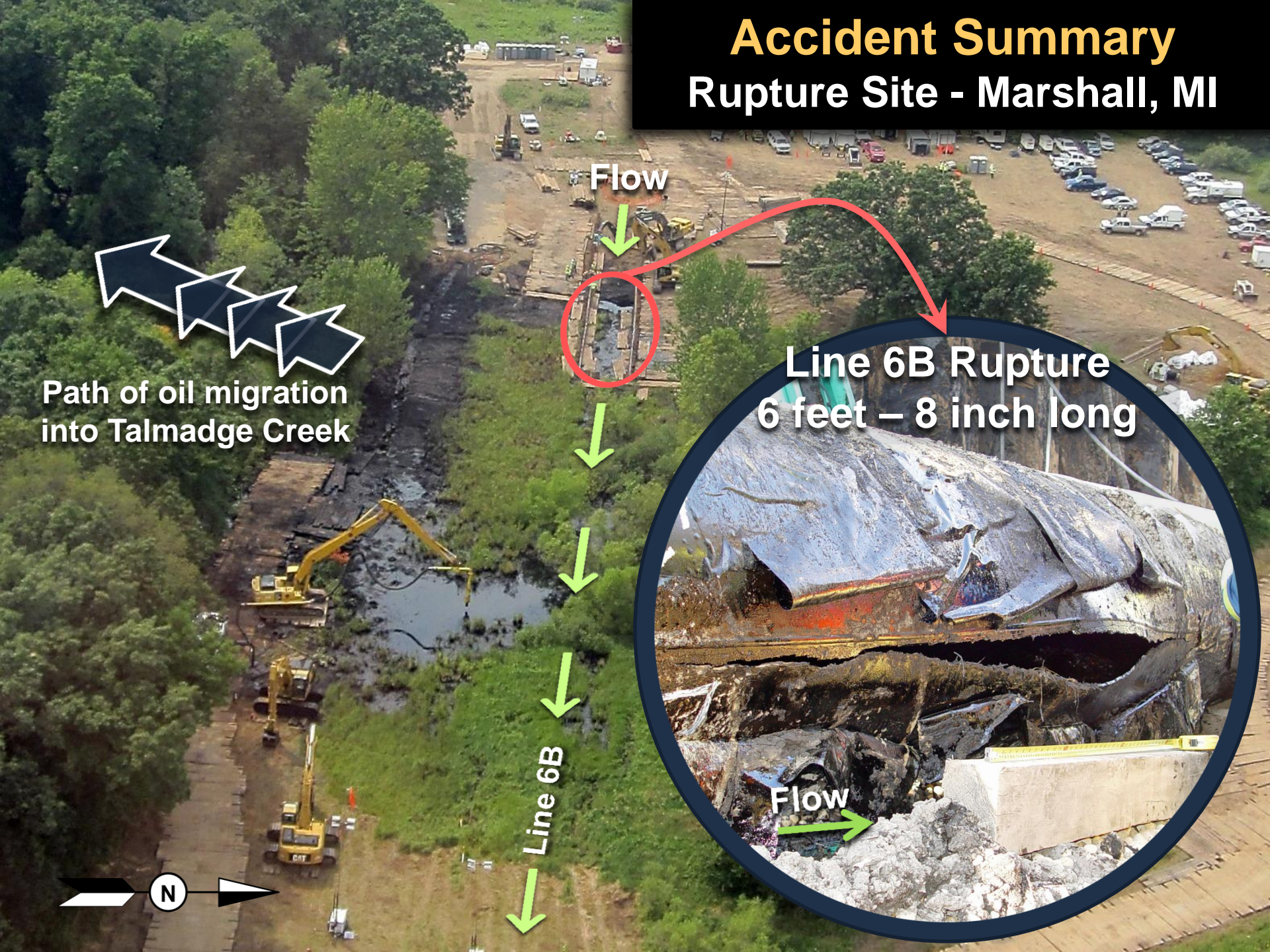
Accident Summary

Enbridge Inc. Liquids System



Accident Summary

Rupture Site - Marshall, MI



Flow

Path of oil migration
into Talmadge Creek

Line 6B Rupture
6 feet – 8 inch long

Flow

Line 6B

N

Probable Cause:

...the probable cause of the pipeline rupture was corrosion fatigue cracks that grew and coalesced from crack and corrosion defects under disbonded polyethylene tape coating, producing a substantial crude oil release that went undetected by the control center for over 17 hours...

Probable Cause (continued) :

...The rupture and prolonged release were made possible by pervasive organizational failures at Enbridge.

Contributing to the severity of the environmental consequences was Enbridge's failure to ensure the availability of sufficient response resources...

Organizational Failures:

- Less than conservative integrity model
- Did not incorporate lessons learned
- Control Center lacked technical leadership
- Poorly defined Control Center roles
- No Control Center team training

Organizational Failures (continued) :

- Tolerance to procedural violations
- Relied on the absence of external notifications
- Control Center punitive environment
- Public awareness deficiencies not addressed
- Environmental response plan inadequate

Safety Management System (SMS):

- Enbridge had a limited SMS
- Comprehensive SMS includes:
 - Integrity management
 - Control center operations
 - Public awareness
 - Environmental response



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